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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,076	06/23/2003	Takahiko Takeda	16869P-083400US	8562

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EXAMINER

WALTER, CRAIG E

ART UNIT PAPER NUMBER

2188

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/603,076	<b>Applicant(s)</b> TAKEDA ET AL.	
	<b>Examiner</b> Craig E. Walter	<b>Art Unit</b> 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 3/3/2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20 is/are allowed.
- 6) ☒ Claim(s) 1-4, 10 and 11 is/are rejected.
- 7) ☒ Claim(s) 5-9, 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/23/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/10/04, 1/3/05, 8/1/03, 6/23/03</u> | 6) <input type="checkbox"/> Other: _____  |

***Specification***

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The phrases "the management information including first control information transmitted from the first host to the second host" in lines 10-11, and "wherein the second host is configured to cause execution of the second copy manager using the first control information to initiate transfer of the data from the first storage subsystem to the second storage subsystem" in lines 16-18 are not

included in the original disclosure (specification) as filed on 6/23/2003, therefore these phrases are considered new matter. The claim will be further treated on its merits excluding these two phrases.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 4, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by West et al. (US Patent 6,446,175 B1).

As for claim 1, West et al. discloses a data processing system, comprising:

a first storage system (column 5, lines 43-44; primary computer system, Figure 1 element 102) including a first host (column 5, lines 57-58; host system, Figure 1, element 108) and a first storage subsystem (column 6, lines 59-60; primary storage medium, Figure 1, element 112), the first host having access to a first copy manager (column 6, lines 1-2; primary storage controller, Figure 1, element 110), the first copy manager being operable to manage a data replication operation (column 6, lines 47-51, the secondary system is used to receive data from the primary storage controller);

a second storage system (column 6, lines 32; secondary computer system, Figure 1 element 104) including a second host (column 6, line 46; remote host system, Figure 1, element 128) and a second storage subsystem (column 6, line 42; secondary storage medium, Figure 1, element 126), the second host having access to a second copy manager (column 6, lines 1-2; secondary storage controller, Figure 1, element 116), the second copy manager being operable to manage a data replication operation; Note in column 6, lines 54-57 West et al.'s discloses the utilization of a link to facilitate the transfer of commands and requests from the primary storage controller to the secondary storage controller. The two controllers themselves are being utilized to send and receive the data during replication hence they are responsible for overseeing these operations.

a first communication link (column 6, lines 53-54; Figure 1, element 118) coupling the first storage system and the second storage system to exchange management information between the first and second storage systems to manage the data replication operation (column 6, lines 54-57, the link facilitates the transfer of commands and requests from the storage controller);

and a data transfer path (column 6, lines 53-54; Figure 1, element 119) configured to transfer data stored in the first storage subsystem to the second storage subsystem and replicate the data of the first storage subsystem in the second storage subsystem, the data transfer path being different from the first communication link (column 6, lines 59-65, link 119 is used to transfer data to the storage controller. Both links can be either uni-directional or bi-directional).

As for claim 4, West et al. discloses the data processing system of claim 1, wherein the first and second storage subsystems are disk array devices (column 5, lines 59-61, and column 6, lines 44-45), the first storage subsystem including a first storage controller (the disk array is actively connected to the storage controller, see Figure 1, also column 6, lines 29-30),

the first storage subsystem being configured to receive a data transfer request from the second storage subsystem (column 6, lines 58-59), the data transfer request being transmitted to the first subsystem by the second subsystem in response to the execution of the second copy manager to initiate the transfer of the data (column 6, lines 59-61, the link is used to transfer data or commands to the primary controller), wherein the first storage subsystem is further configured to transfer the data to the second storage subsystem via the second communication link upon transmitting or receiving the data transfer request from the second storage subsystem (column 6, lines 54-56, the communication link can be used to transfer requests from the primary controller to the secondary controller).

As for claim 10, West et al. discloses the data processing system of claim 1, wherein the first and second copy managers are asynchronous copy managers (column 4, lines 32-35), and the first and second storage subsystems are provided in remote locations from each other (column 3, lines 18-22), and the first communication link and the data transfer path are the same communication network (column 6, lines 52-54;

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Figure 1, elements 118-119 disclose two bi-directional links that both connect each computer system (Figure 1, elements 102 and 104). These links combined with the two computer systems comprise a network (as defined by the dictionary as two or more computers connected together with the ability to communicate with each other).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. as applied to claim 1 above, and further in view of Ohran (US Patent 6,609,183 B2).

As for claim 2, though West et al. does specifically teach the data processing system of claim 1, wherein the first copy manager of the first host uses the management information to manage the first storage subsystem for the data replication operation (column 6, lines 11-15 the primary storage controller comprises internal memory for recording virtual disk volumes. Note the primary volume provides a logical interface to the data stored in the disk array which is to be copied to the secondary storage system, column 6, lines 20-24), the second copy manager of the second host using the management information to manage the second storage subsystem for the

data replication operation (likewise with the secondary storage system, the secondary volume as described in Figure 1, element 124 represents a virtual disk of remote data stored in the secondary disk array, column 6, lines 43-45). West et al. however does fail to limit the communication link as coupling the first and second hosts as claimed by applicant.

Ohran however does teach a method and system for mirroring mass storage devices by utilizing a communication link directly between the primary and second hosts (Figure 1, element 16; column 8, lines 57-60). It would have been obvious to one of ordinary skill in the art at the time of the invention for West et al. to include Ohran's method of further including a direct communication link between each host. By doing so, West et al.'s system would benefit from this direct connection, as it would add additional redundancy in the data communication paths between the primary and secondary systems at minimal cost, i.e. the additional redundancy can be easily achieved with very minimal additional hardware and/or software to a set of computers already networked. The hardware and/or software additions would be minimal as Ohran teaches the communication link (element 16) as being a very basic and common means for networking computers (the link can be a WAN or LAN network as described in column 10, lines 33-35).

As for claim 3, West et al. (in further view of Ohran) further teaches the data transfer path as a second communication link (Figure 1, element 119) coupling the first and second storage subsystems.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. as West et al. teaches of the coupling of a first storage system to a first external storage device for transferring the data from the first storage system to the first external storage device (Figure 1, element 106; column 7 lines 7-10). West et al. however fails to include said data link as part of the data transfer path as claimed by applicant. However, it would have been obvious to one of ordinary skill in the art at the time of the invention for West et al. to further include a direct link from his data transfer path to the external storage device. West et al.'s teachings allow for a means to mirror data from the primary computer system to external storage device through the secondary computer device. By adding the direct link, West et al. would be able to circumvent the secondary storage system in order to directly mirror the data to the external device. This obvious modification would provide West et al. with an alternative (albeit a simpler) means of copying the data to the external device in case a problem was encountered with communication links 118 and 119.

***Allowable Subject Matter***

6. Claims 5-9, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. Claims 13-20 are allowed.

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8. The following is a statement of reasons for the indication of allowable subject matter:

As for claim 5, while West et al. in further view of Ohran teaches the data processing system of claim 3, wherein the first storage subsystem includes a first storage controller (West et al. Figure 1, element 110), a first storage area for storing data (Figure 1, element 112), their teachings combined do not arrive at the limitations as claimed by applicant with respect to journal transferring. Further, Koseki et al. (US Patent 6,732,124 B1) teaches of a data processing system for restoring file systems based on transaction logs. In his teachings, Koseki et al. describes a journal (log records) which include metadata which are stored in a computer's secondary storage area (column 1, lines 43-48). The metadata is then cached in the computer's main memory (column 1, line 51-52), and then written back to the secondary storage unit so that every modification made to the cached metadata is reflected in the secondary storage unit at a later time (column 1, lines 53-56). Though Koseki et al.'s teachings are similar to those claimed by applicant, no reasonable combination could be made with prior art of record to meet every limitation of the claim.

As for claim 12, while West et al. teaches all of the limitations in claim 11, he does not disclose a second data link coupling the second storage system to a second external storage device.

As for claim 13, though West et al. teaches of a method for performing remote replication in a data processing system including a first storage system including a first host and first storage subsystem and a second storage systems including a second host and a second storage subsystem, he fails to teach further limitations of this claim including transmitting a completion notification, receiving a restore command, and performing a restoration process in the way as described by applicant. No other prior art of record could be combined with West et al. to further meet the limitations of this claim therefore it is deemed allowable.

As for claim 15 and 17, West et al. teaches of a method (as in claim 15) for storing data in a storage system, comprising: storing data in a first storage area in the first storage subsystem according to an instruction of a first host associated with the first storage subsystem (column 5, line 65 through column 6, line 6); However, again his teachings do not arrive at the limitations as claimed by applicant with respect to journal transferring. Even though Koseki et al. discloses log records (journal) including metadata which are stored and transferred between a computer's secondary storage area and main memory, his teachings fails to include notifying a host the subsystem is ready to transfer the updated journal. No reasonable combination could be made with prior art of record to meet every limitation of this claim. Likewise, no reasonable combination could

be made with prior art of record for a computer readable medium containing code means to carry out said method (as in claim 17).

As for claim 18, West et al. teaches a storage subsystem provided in a data processing system (Figure 1, element 100), the data processing system including a first storage system and a second storage system (Figure 1, elements 102, and 104), the first storage system including a host (Figure 1, element 108) and the storage subsystem (Figure 1, element 112), wherein the storage system comprising:

- a storage controller (Figure 1, element 110) to communicate with the host that is coupled to a remote host (Figure 1, element 128) of a remote storage system via a first communication link (Figure 1, element 118), the first communication link being configured to exchange management information between the host of the storage subsystem and the remote host of the remote storage system (column 6, lines 57-62);

- a first storage area (Figure 1, element 112) to store data according to an instruction of the host of the storage subsystem.

West et al.'s teachings however do not arrive at the limitations as claimed by applicant with respect to journal transferring. Just as described earlier paragraphs with respect to Koseki et al.'s teachings, no reasonable combination can be made with prior art of record to meet every limitation of this claim.

As for claim 19, though West et al. teaches of a data processing system, comprising: a primary storage system (Figure 1, element 102) including a primary host (Figure 1, element 108) and a primary storage subsystem (Figure 1, element 112), the primary storage subsystem being configured to perform an asynchronous remote replication procedure (column 8, lines 33-35 "the data is asynchronously transmitted to the secondary system"), the primary storage subsystem including a first storage area for storing data (Figure 1, element 112), he again does not teach the limitations as claimed by applicant with respect to journal transferring, nor does he arrive at the limitations with respect to utilizing a third or fourth storage subsystem, hence the claim in its entirety is deemed allowable.

9. Claims 6-9, 16 and 20 further limit claims 5, 15 and 19 respectively therefore they too are deemed allowable.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Yanai et al. (US Patent 6,173,377 B1) teaches of a system for remote data mirroring.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Craig E Walter

Art Unit: 2188

Examiner  
Art Unit 2188

CEW

*Mano Padmanabhan*  
*6/10/05*

**MANO PADMANABHAN**  
**SUPERVISORY PATENT EXAMINER**